

Remarks

The Office Action mailed March 16, 2005 has been carefully considered. After such consideration, Claims 1-54 have been amended. As such, Claims 1-26; 27; 28-52; and 53-54 remain in the case with not of the claims allowed.

The Examiner had rejected independent apparatus Claims 1, 27, and 28 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, in Claims 1 and 28, the Examiner said that the preamble and step (d) were inconsistent, making it unclear as to what is occurring in the claim. The Examiner also rejected Claim 27 saying it is unclear as to what the scheduling problem is and how the solution is generated, and that there is no step that recites any providing of the solution.

The Examiner will note that Claim 1 has been amended to recite "said genetic module to generate a schedule of said plurality of time-dependent tasks." Therefore, Claim 1 has been amended to clarify that all tasks may be scheduled. Independent Claim 28 has been similarly amended. With respect to Claim 27, it recites a dynamic programming module including a hashing function and a binary tree. There is not a step reciting any providing of a solution because the claim is not a method claim. Rather Claim 27 recites the elements of the dynamic programming module that is used for generating lowest-cost partial paths for a plurality of time-dependent tasks.

The Examiner also rejected Claims 1-54 under 35 U.S.C. 101 as being directed to non-statutory subject matter. Applicant has amended Claims 1-54 to specify that the system is performed by a computer.

The Examiner rejected Claims 1-26 and 28-54 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,319,781 to Syswerda in view of U.S. Patent No. 5,241,465 to Oba *et al.* Additionally, the Examiner rejected Claim 27 under 35 U.S.C. 103(a) as being unpatentable over Oba *et al.* in view of Syswerda.

As the Examiner is aware, it is the burden of the Examiner to establish a prima facie case of obviousness when rejecting claims under 35 U.S.C. 103 (In re Reuter, 651 F. 2d. 751, 210 U.S.P.Q. 249 (CCPA 1981)). In this case, The Applicant respectfully submits that the Examiner has failed to establish a prima facie case of obviousness.

Hashing cannot be used in the Oba *et al.* patent in the same manner as in the present invention because the Oba *et al.* system creates schedules one step at a time. In contrast, the system of the present invention deals with entire schedules at once. Because of this difference, Oba's system must defer detection of duplicate schedules until after a significant amount of computation is done in building and evaluating a number of partial schedules.

For example, suppose the present invention was being utilized to build a schedule with tasks, "A, B, C, D and E." The scheduling system of the present invention would create schedules that always contain all permutations of all five tasks, such as "A-C-D-B-E," "B-C-D-E-A," and so on. All the tasks are in all the schedules all the time. Before it invests considerable resources in evaluating the schedule, the scheduling system of the present invention checks once (via hashing) to see whether this schedule is a duplicate. Because the scheduling system of the present invention is dealing with complete schedules, it is confident that it will identify exact duplicates in our hashing function.

In contrast, the Oba *et al.* system constructs schedules one step at a time, with partial evaluation done after each step (Col. 2, lines 5-25). So a particular sequence on the Oba system may be something like this:

1. Start with an empty schedule.
2. Insert task "A," making a partial schedule ("A").
3. Evaluate the partial schedule.
4. Insert task "C," making a partial schedule ("A-C").
5. Evaluate the partial schedule.
6. Insert task "D," making a partial schedule ("A-C-D").
7. Evaluate the partial schedule.

Because the Oba *et al.* system deals in partial schedules, it is not possible to detect duplicate schedules via hashing until the entire schedule is complete. Using the same A,B,C,D,E tasks as before, consider a schedule that begins with "A-B-C," with two tasks left to be scheduled. There are two possible choices for the next task: D and E.

If it is already known that in the past, schedule "A-B-C-D-E" has been created, can the "A-B-C" schedule be deleted via hashing? No, because at this point it is not known whether D or E will be chosen next. That is, it's possible the partial schedule we've got could eventually turn out to be "A-B-C-E-D," which has never been seen before.

It is very important to note that by delaying the hashing and detection of duplicates, Oba *et al.* invests a considerable amount of time in constructing and evaluating partial paths that may end up being useless. Accordingly, it is respectfully submitted that the present invention is a patentable improvement over the teachings of Oba.

As to the Syswerda patent, a discussion of hashing is irrelevant. The main difference between the present inventions and Syswerda can be found in Claim 1. Syswerda teaches that among their system's first tasks is to explicitly build schedules that satisfy the "hard" constraints, and then use their genetic process to build schedules to satisfy the "soft" constraints. So some part of Syswerda's solutions are pre-scheduled prior to the genetic module.

In contrast, the system of the present invention does not pre-build schedules that satisfy the "hard" constraints, as doing so would require quite a bit of advance knowledge about both the problem domain, and the rigidity of the constraints. By building that into their system, Syswerda has essentially "hard coded" knowledge about the problem domain, limiting the flexibility of their system.

Every time the problem changes, Syswerda's knowledge base must also change. Because of that key difference, discussing similar hashing possibilities misses the point. Accordingly, it is respectfully submitted that the present invention is a patentable improvement over the teachings of Syswerda.

The Applicant submits that by this amendment he has placed the case in condition for immediate allowance and such action is respectfully requested. However, if any issue remains

unresolved, Applicant's attorney would welcome the opportunity for a telephone interview to expedite allowance and issue.

Respectfully submitted,



Edward W. Rilee
Registration No. 31,869
MacCord Mason PLLC
P. O. Box 2974
Greensboro, NC 27402
(336) 273-4422

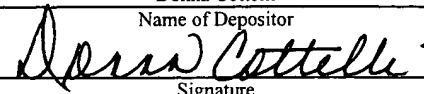
Date: July 18, 2005
File No.: 4675-008

CERTIFICATE OF MAILING

I HEREBY CERTIFY THAT THIS DOCUMENT IS
BEING DEPOSITED WITH THE UNITED STATES
POSTAL SERVICE AS FIRST-CLASS MAIL, IN AN
ENVELOPE ADDRESSED TO: COMMISSIONER
FOR PATENTS, P.O. BOX 1450, ALEXANDRIA,
VA 22313-1450, ON JULY 18, 2005

Donna Cottelli

Name of Depositor



Signature

July 18, 2005

Date of Signature